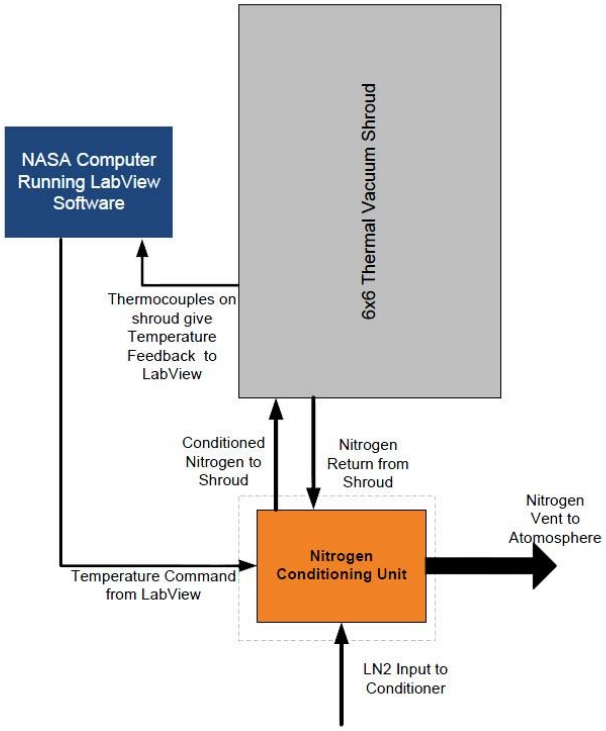
The 6x6 thermal vacuum chamber in B1250 at NASA LaRC is equipped with a temperature controlled shroud system that circulates conditioned gaseous nitrogen to obtain a desired temperature between -150°C and +150°C. A new nitrogen conditioning system is required to replace the aging unit currently in place. The shroud in the 6x6 is divided into three zones: the main platen (~4'x4'), the cylindrical shroud (~5'Dx5'L), and the circular door (~5'D). These zones are controlled together from a single source, and the split in the plumbing is made downstream of the primary supply from the current blower system. Therefore, the new conditioner shall be sufficiently sized to cool or heat all three zones in parallel, about 200 ft^2 total area.

Requirements:

- System shall heat, cool, and circulate nitrogen through the existing NASA shroud and be able to achieve -150°C to +150°C.
- System shall be sized appropriately, in terms of flow rate and heater power, to control a total shroud area to a precision of +\- 5C across the shroud. Supplier should provide engineering rationale, via analysis, best practice, or past experience to justify the chosen unit.
- System shall accept direct liquid nitrogen (LN2) as the primary input.
- System shall contain the valve for controlling input of LN2. Redundant fail-safe valves are desired, but not required.
- System shall have both manual controls at the unit and data ports for remote control from a computer running either supplier furnished software or LabView.



- If mechanical cooling of the system is required, the cooling medium shall be chilled water. The NASA facility chilled water supply parameters are: Temperature: ~50°F; Flow Rate: <4gpm; Differential Pressure: ~20psi.
- All bids shall contain a footprint drawing or sketch and contain all facility infrastructure requirements: power, LN2, GN2, chill water, vent, etc.
- All bids shall contain a drawing or sketch with all mechanical interfaces defined. Examples include LN2 nitrogen supply; conditioned nitrogen supply, return, and vent on the conditioner unit; and chill water hookups.
- Unit shall be delivered to NASA Langley Research Center, Hampton, VA. All bids shall include delivery estimates.

The following items shall be bid as optional line items. NASA reserves the right to accept any or all of the following.

- Over-temperature and under-temperature monitoring with fail-safe controls in place. Alerts and alarms shall be output through a data port to the furnished system software or LabView as described above.
- All mechanical interfaces between supplied nitrogen conditioner and NASA Shroud. Each interface shall be <6ft of flexible line capable of temperatures as stated above. Details of exact specifications and lengths will be worked between NASA and supplier as designs mature. For the purposes of bidding, assume each line is 6ft. All connections to a flange shall include the flange plate and associated bulkhead fitting. These include:
  - conditioned nitrogen supply from supplier unit to NASA's ASA-4 flange.
  -conditioned nitrogen return via NASA's ASA-6 flange.
  - Nitrogen vent via NASA's ASA-10 flange.
  -LN2 supply line to NASA's ~3/8” copper tube supply.
- Onsite installation at NASA Langley, Hampton, VA. Including electrical hookup to NASA's existing 220V or 440V supply and operational verification.